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Institute of American Indian Arts
83 Avan Nu Po Road

Santa Fe, NM 87508 -1300

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The views, opinions and/or findings contained in this report are those of the author(s) and should not contrued as an official Department of the Army position, policy or decision, unless so designated by other documentation.

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RPPR Final Report
as of 11-Jun-2018

Agency Code:

Proposal Number: 68886CSREP **Agreement Number: W911NF-16-1-0467**
INVESTIGATOR(S):

Name: Mats Reiniusson
Email: mreiniusson@iaia.edu
Phone Number: 5054242349
Principal: Y

Organization: **Institute of American Indian Arts**
Address: 83 Avan Nu Po Road, Santa Fe, NM 875081300
Country: USA

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Final Report for Period Beginning 15-Aug-2016 and Ending 14-Nov-2017
Title: Immersive Laboratory
Begin Performance Period: 15-Aug-2016 **End Performance Period:** 14-Nov-2017
Report Term: 0-Other

Submitted By: Mats Reiniusson Email: mreiniusson@iaia.edu
Phone: (505) 424-2349

Distribution Statement: 1-Approved for public release; distribution is unlimited.

STEM Degrees: 0 **STEM Participants:** 7

Major Goals: The Institute of American Indian Arts (IAIA) proposed the creation of a modern Immersive Laboratory by updating and augmenting our existing virtual reality facilities to enhance STEM education and research with the purchase and installation of state of the art projectors, computers, and theater equipment to update IAIA's immersive Digital Dome theater. The updated computer audio and vision infrastructure for high resolution immersive video and audio will assist in the exploration interactive immersive imagery, wireless motion capture, depth sensors and other interactive components that will aid in the development of immersive simulations. Students will be able experiment with this laboratory equipment alongside educators and researchers in the IAIA Immersive laboratory.

Accomplishments: IAIA is currently conducting the DoD project entitled "Interactivity and Simulation in Immersive Virtual Environments (proposal #67276-RT-REP)", which outlines a research initiative that builds on prior successful research to deliver interactive immersive displays. The primary research objective is the development of simulation and real-time interactivity for immersive technology through the use of gestural interfaces and biological sensors. Fulldome projection and interactivity are being extended to arbitrary display surfaces and head-mounted displays. A universal production pipeline for immersive displays is being developed, which includes 3D graphics and 3D sound. This project will directly feed into a research base in support of national defense: Virtual Simulation and Immersive Environments— while also supporting the STEM educational needs of our Native American student body.
The project defines an IAIA, STEM-based curriculum in computer programming and interactive immersive technologies thus increasing the number of underrepresented minorities participating in STEM disciplines. The project exposes students to courses and research in virtual technologies, simulation, and interactive immersive environments. The laboratory will enhance IAIA's capacity to deliver cutting edge technology training, enhance STEM components of IAIA's liberal arts curriculum, and support students' application of their creative capabilities into high-technology STEM fields. This will increase the economic and professional opportunities for IAIA students, and help develop an educated workforce in virtual and live immersive technology industries.
Summary of the most important results
IAIA was able to purchase and install of the equipment that was mentioned in the DOD project entitled "Interactivity and Simulation in Immersive Virtual Environments (proposal #67276-RT-REP)".
The items included the following:
Digital Dome Projection System with Five Barco WQXGA Projectors with Ultra Wide Angle Zoom, Noise Reduction Kits, Video Extenders, Mounting and Blending System
A three-dimensional Genelec 24.4 sound system that integrates with Digital Dome system
Upgrades to the Black Box computer system Mac Pro 12-Core Computer, Custom Intel Broadwell-E Core i7

Quadro 4U PC Workstation, Rackmount GTX 1080TI VR workstations
Fisheye Video Recording system with RED EPIC-W 8K and Scarlet Dragon 5K cameras and lenses
360 Degree Video Recording System with 360Fly kits
360 Audio Recording System with Sennheiser Ambeo, Zoom F8 for ambisonic recording
Interactive and 3D simulation system with the Meta Motion IGS Cobra Motion Capture system
Digital Dome Theater System upgrade with stage lights, DMX light controllers, Interactivity controllers, PA sound system

Training Opportunities: Immersive interactive training with the Cobra Motion Capture system
Immersive interactive training with the HTC Vive system
Dome calibration and dome setup training

Results Dissemination: Presentation of Digital Dome Immersive Laboratory upgrade and new Production Equipment disseminated through press release to local community, Colleges, Technology Magazines, local and international organizations and Institutions.

Honors and Awards: Nothing to Report

Protocol Activity Status:

Technology Transfer: Nothing to Report

PARTICIPANTS:

Participant Type: PD/PI
Participant: Mats Reiniusson
Person Months Worked: 15.00 **Funding Support:**
Project Contribution:
International Collaboration:
International Travel:
National Academy Member: N
Other Collaborators:

Participant Type: Other Professional
Participant: Charles Veasey
Person Months Worked: 12.00 **Funding Support:**
Project Contribution:
International Collaboration:
International Travel:
National Academy Member: N
Other Collaborators:

Participant Type: Consultant
Participant: Robert Drummond
Person Months Worked: 3.00 **Funding Support:**
Project Contribution:
International Collaboration:
International Travel:
National Academy Member: N
Other Collaborators:

Participant Type: Consultant
Participant: Joe Dean
Person Months Worked: 2.00 **Funding Support:**
Project Contribution:

International Collaboration:
International Travel:
National Academy Member: N
Other Collaborators:

Participant Type: Undergraduate Student
Participant: Nathaniel Fuentes
Person Months Worked: 3.00 **Funding Support:**
Project Contribution:
International Collaboration:
International Travel:
National Academy Member: N
Other Collaborators:

Upload of accomplishments/progress for grant W911NF1610467.

Nothing to report in the uploaded pdf (see accomplishments)